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(54) Transport device for gas-filled bags.

(57) Transport device for transporting gas-filled bags. The transport device includes: a blower and transport ducts. The blower is connected to the transport ducts via a connecting duct. The transport device is provided with a production installation for the production of gas-filled bags and a storage apparatus for gas-filled bags, wherein the production installation and the storage apparatus are connected with each other via the transport ducts.

The contents of this patent correspond to the originally filed description with claim(s) and any drawings.

### **Transport device for gas-filled bags**

The invention relates to a transport device for transporting gas-filled bags.

Such transport of gas-filled bags, hereafter called gas bags, which for example are used in the packing of goods in boxes as a protective layer between the goods and the transportable box, has up to now been carried out manually. For this a container is filled with gas bags by an operator at the site of a production installation for the production of such gas bags; then the container is moved by the operator to a place where these gas bags are used in packing activities. After the container has been emptied, it is moved back to the production installation, after which the cycle is repeated. This mode of transport has the disadvantage that it is relatively costly because it is labor intensive and the containers take up a large amount of space.

The object of the invention is to provide a transport device in which, among other things, these disadvantages are avoided.

For this a transport device of the above-described type in accordance with the invention is characterized in that the transport device includes: a blower and transport ducts. With the use of such a transport device it is no longer necessary to have an operator who uses a rolling container to transport the gas bags to the packing station where the gas bags are used.

The blower is preferably connected to the transport ducts via a connecting duct.

The invention further provides that the transport device contains: a storage apparatus for storage of the gas-filled bags, wherein the production installation and the storage apparatus are connected with each other via the transport ducts. In this way gas bags, after they have been produced, can be transported to the storage apparatus without operator intervention.

The invention further provides that the transport ducts contain means for diverting gas-filled bags to the storage apparatus. Thus, when multiple storage apparatuses are connected in succession with the transport ducts, a given storage apparatus can be filled selectively. The advantage of this is that gas bags can be delivered to any desired number of different locations.

In another embodiment the production installation includes cutting means for cutting a strip of mutually connected gas-filled bags into separate strips of a desired number of mutually connected gas-filled bags. Thus, suitably manageable strips of a desired number of mutually connected gas bags are obtained for packing. The desired number of mutually connected gas bags may be, for example, three.

According to the invention the storage apparatus includes an opening for the manual removal of gas-filled bags. Preferably the storage apparatus is positioned in such a manner that the opening is located at shoulder height of the packer. A packer can thus take gas bags from the storage apparatus in an ergonomically favorable way.

In a preferred embodiment the storage apparatus includes at least one sensor for measuring the level of the gas-filled bags in the storage apparatus. This makes it possible for a packer to always have an adequate number of gas-filled bags available.

Preferably two pairs of sensors are provided, wherein the upper pair of sensors is arranged to be fixed and the lower pair is arranged to be movable. The upper pair of sensors serves for detection of the maximum level of the gas bags. The lower pair of sensors serves for detection of the minimum level of the gas bags. The lower pair is implemented in a moveable manner so that when the storage apparatus is emptied quickly the position of the lower pair of sensors can be adjusted in such a way that an adequately high level of the gas bags is always ensured.

The transport device advantageously includes a control apparatus for regulating the operation of the transport device. Thus, for example, automatic operation of the transport device can be enabled.

In a preferred embodiment the transport device includes means for the introduction of pressurized air into the connecting duct. By this means, extra pressure can be created, when appropriate, for transporting the gas bags.

By way of example, a working example of the invention will be described next with reference to the figure.

Figure 1 is a schematic representation of the transport device 1 for gas bags 2 in accordance with the invention. The transport device 1 comprises transport ducts 3, a blower 4, storage apparatuses 5, 15 for the storage of gas bags, a control apparatus 6, and a production installation for the production of gas bags. The gas bags 2 are transported through the transport ducts 3 from the production installation to the storage apparatuses 5, 15.

The gas bags 2 are produced in the production installation 7. The gas in the gas bags 2 can be, for example, air. The production installation 7 includes cutting means 25 for cutting a strip of mutually connected gas bags into separate strips of three mutually connected gas bags 2. The strips of mutually connected gas bags can also be cut into separate strips of some other number of mutually connected gas bags, depending on the goods to be packed. The gas bags 2 cut by the production installation 7 are fed into the transport duct 3.

The blower 4 is preferably connected to the transport duct 3 via a connecting duct 8. In the part of the transport duct 3 between the production installation 7 and the location where the connecting duct 8 joins the transport duct 3, a negative pressure is created by the blower 4 so that the gas bags 2 are moved from the production installation 7 in the direction of the storage apparatuses 5, 15. It is noted that the placement of the blower 4 could be chosen differently. Thus, the blower 4 could be connected to the transport ducts 3 after the storage apparatuses 5, 15 so that transport of the gas bags takes place by a suction effect. A negative pressure will then be produced in the transport ducts 3. It is also possible to connect the blower 4 to the transport ducts 3 at the site of the production installation 7, so that transport of gas bags 2 takes place by a pressure effect. A positive pressure will then be produced in the transport ducts 3.

The two storage apparatuses 5, 15 are provided with diverter means 9, 19 (dampers) for diverting gas bags 2 from the transport ducts 3 to the appropriate storage apparatus 5. The storage apparatuses 5, 15 have openings 11, 21 from which a packer 12 can remove gas bags 2. The storage apparatuses 5, 15 are preferably set up in such a manner that the openings 11, 21 are located at a favorable height, from an ergonomic standpoint, preferably at shoulder height.

The individual components of the transport device 1 are preferably controlled with the aid of a control apparatus 6. The control apparatus 6 is connected to the blower 4, the production installation 7, the storage apparatuses 5, 15, the cutting means 25, the diversion means 9, 19,

and sensors 10, 10', 20, 20'. The diversion means 9, 19 are preferably controlled in a manner that is dependent on the level of the gas bags 2 in the storage apparatuses 5, 15. The storage apparatuses 5, 15 are for this purpose each provided with at least one sensor. In the cited example, two pairs of sensors 10, 10', 20, 20' are provided for control of the level of the gas bags 2 in the storage devices 5, 15. The sensors 10, 10', 20, 20' generate an input signal for the control apparatus 6, which also controls the diversion means 9, 19. It is noted that embodiments of the storage apparatuses 5, 15 with one or some other number of sensors per storage apparatus are also possible.

While the invention has been described with the aid of a transport device 1 with a control apparatus 6, it is also possible to employ a transport device without a control apparatus. Operation of the blower 4, the production installation 7, and the diversion means 9, 19 for the diversion of gas bags 2 can also be carried out, for example, manually.

### CLAIMS

1. Transport device for transporting gas-filled bags, **with the characteristic** that the transport device includes a blower and transport ducts.
2. Transport device in accordance with claim 1, **with the characteristic** that the blower is connected to the transport ducts via a connecting duct.
3. Transport device in accordance with claim 1 or 2, wherein the transport device is provided with a production installation for the production of gas-filled bags, **with the characteristic** that the transport device further includes a storage apparatus for the storage of gas-filled bags, wherein the production installation for the production of gas-filled bags and the storage apparatus are connected with each other via the transport ducts.
4. Transport device in accordance with claim 3, **with the characteristic** that the transport ducts include diversion means for the diversion of the gas-filled bags to the storage apparatus.
5. Transport device in accordance with claim 3 or 4, **with the characteristic** that the production installation includes cutting means for cutting a strip of mutually connected gas-filled bags into separate strips of a desired number of mutually connected gas-filled bags.
6. Transport device in accordance with one of claims 3-5, **with the characteristic** that the storage apparatus has an opening for manual removal of gas-filled bags.
7. Transport device in accordance with one of claims 3-6, **with the characteristic** that the storage apparatus includes at least one sensor for measurement of the level of the gas-filled bags in the storage apparatus.
8. Transport device in accordance with claim 7, **with the characteristic** that two pairs of sensors are provided, wherein the upper pair of sensors is arranged to be fixed and wherein the lower pair of sensors is arranged to be movable.

9. Transport device in accordance with one of the preceding claims, **with the characteristic** that the transport device has a control apparatus for the control of the operation of the transport device.
10. Transport device in accordance with one of the preceding claims, **with the characteristic** that the transport device includes means for the introduction of pressurized air into the connecting duct.

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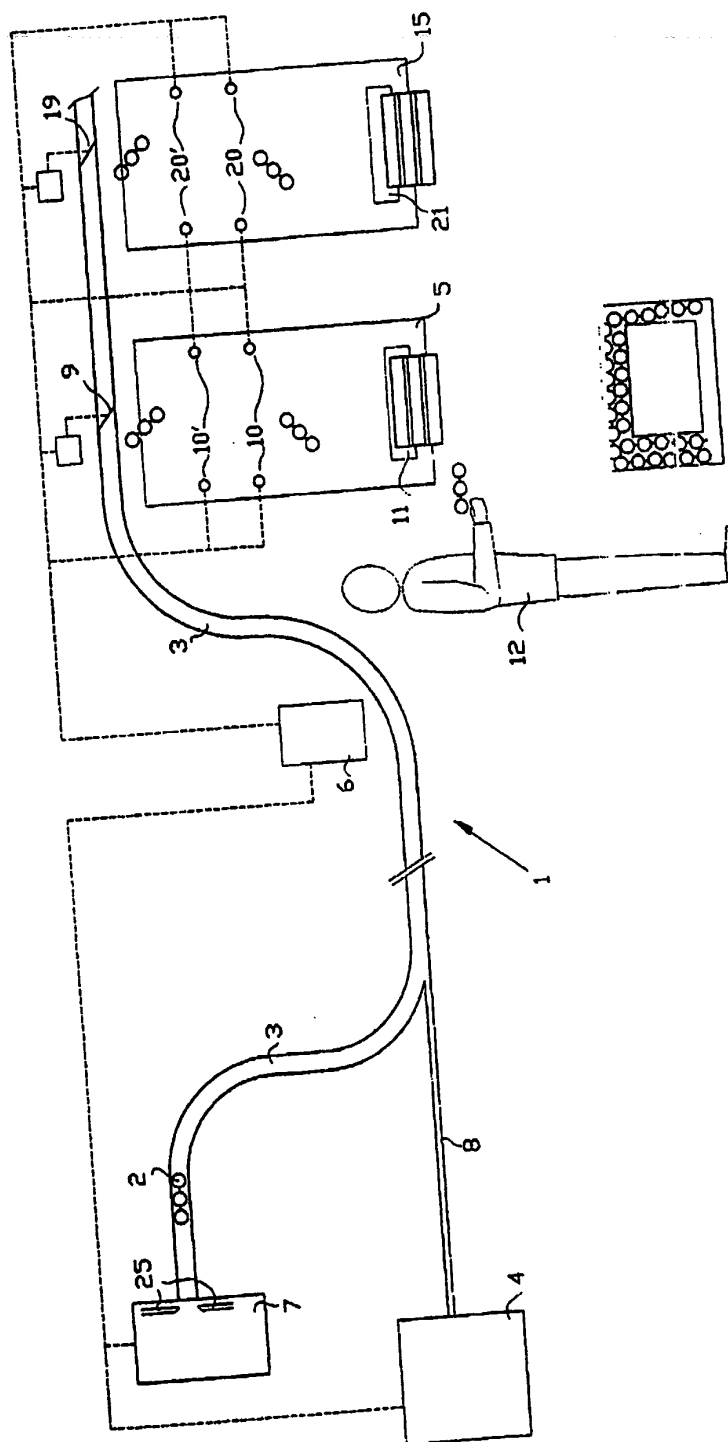


FIG. 1